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MAGNETIC-FIELD SENSOR HAVING MAGNETIC NANOPARTICLES

ABSTRACT

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A structure and method for forming a magnetic-field sensor device comprises depositing a first electrode onto a substrate. Then, an electrically insulating layer is deposited on the first electrode. Next, a portion of the insulating layer is removed to expose a region of the first electrode, thereby creating an empty space. After this, at least one layer of chemically-synthesized nanoparticles is deposited on the insulating layer and within the empty space. Next, a second electrode is deposited on both the layer of nanoparticles and the insulating layer. Alternatively, multiple layers of nanoparticles may be deposited, or only a single nanoparticle may be deposited. The substrate is either conducting or non-conducting, and the first and second electrodes are electrically conducting and may be magnetic or non-magnetic. Additionally, a metallic layer of magnetic material may be first deposited on the substrate.